Incorporating Natural Dispersant Surfactants Such as Lipoproteins in Thin Fluid Layer to Enhance Artificial and Natural Olfactory Sensors/Receptors

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Introduction

Why is a dog's nose often wet? Ask a veterinarian and they will claim it is part of the dog's immune system or, if they are honest, they might even admit that they do not know why. Understanding the fundamental reason for this may turn out to be critical to fully understanding the dynamics of natural olfactory perception in dogs and humans alike.

Abstract

It is, firstly, important to understand, whether it is currently understood or accepted by the scientific community or not, that olfactory perception in mammals must rely, much as pulmonary respiration does, upon a thin layer of fluid rich in surfactants to facilitate the capture and rapid diffusion of relevant particles. In pulmonary respiration, oxygen is first captured by the fluid and natural dispersant surfactant molecules speed the migration of oxygen to the alveoli where the actual oxygen-CO2 exchange takes place. Without the fluid, the process couldn't even begin. Without natural surfactants, the process would not be efficient enough to support life.

For the perception of scent, a very comparable surfactant-rich thin fluid layer is necessary to efficiently capture odorific nanoparticles and propel them toward the functional scent receptors to facilitate the olfactory process.

Interestingly, salts, when added to dispersant-rich water, strongly mitigate the dispersant effects of the molecules as salts promote surface tension and surfactants reduce it. Thus, if olfactory perception depends upon dispersants, it would stand to reason that the dispersants can best do their work in a salt-free environment.

Too thick of an olfactory fluid layer and the odorific particles have to travel too great a distance to be perceived before decomposition; for a nanoscopic particle, about a one-second process. Flushing the nose continually with carbohydrate and lipoprotein-laden, salt-free fluid would, so long as the drainage system of the nose is efficient, keep the olfactory perception of an animal functioning optimally. I would submit that the moisture at the end of a dog's nose is a byproduct of a system for maintaining an ultra-low salinity in the olfactory regions of the snout to enhance motility of odorific molecules through this hypothesized surfactant layer.

Conclusion

If this is indeed the dynamic at play in natural olfactory processes, this essential element of natural scent perception could be readily duplicated in "artificial nose" systems which have a variety of potential applications,

ranging from a "Shazam for Perfumes," to a scent-based in-person dating app to a detector for hazardous chemicals and even as a divining rod for finding missing persons when trained dogs are unavailable.